



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Northwest Region  
7600 Sand Point Way N.E., Bldg. 1  
Seattle, WA 98115

Refer to:  
OSB1997-0634

May 16, 1997

Brig. General Robert H. Griffin  
Division Commander, North Pacific Division  
U.S. Army Corps of Engineers  
P.O. Box 2870  
Portland, Oregon 97208-2870

Re: Endangered Species Act Section 7 Biological Opinion on permit application number 96-697 by the Inland Land, Inc., for construction of a pumping facility on the Columbia River

Dear General Griffin:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) on permit application number 96-697 by the Inland Land, Inc. for construction of a pumping facility on the Columbia River. NMFS concludes in this Opinion that the impact of the pumping facility jeopardizes the existence of listed Snake River salmon. Pursuant to section 7 of the ESA, NMFS included reasonable and prudent alternatives (RPA) in the Opinion that NMFS believes will avoid jeopardy.

This letter also provides notice to Corps of Engineers (COE) that NMFS is updating guidance provided to the COE Seattle District on September, 26, 1994<sup>1</sup>. That guidance notified the COE when it should conduct formal consultation under Section 7 of the ESA for a permit likely to result in water withdrawals that have an adverse effect on listed Snake River salmon. Then, NMFS recognized three different consultation circumstances. NMFS recommended formal consultation for any permit in the Snake River above Ice Harbor Dam that was likely to result in a water withdrawal greater than 5 cfs. NMFS also recommended formal consultation for any permit in the mainstem of the Snake River up to Ice Harbor Dam that was likely result in a water

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<sup>1</sup> Letter from William Stelle, Jr., to Colonel Donald T. Wynn (September 16, 1994)(regarding permits for water withdrawal projects; Flat Top Ranch informal consultation).

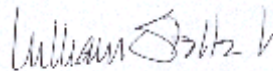
withdrawal greater than 25 cfs. For all other mainstem or tributary diversions within the Columbia Basin, include or outside a critical habitat, NMFS recommended a case-by-case review to decide whether formal or informal consultation was necessary.

New guidelines are warranted in light of new information provided by the Bureau of Reclamation (BOR) concerning the significant adverse effects of water development on the ability of federal agencies managing the Federal Columbia River Power System (FCRPS) to meet flow targets identified in the 1994-1998 FCRPS biological opinion, issued on March 16, 1994. NMFS now recommends that COE initiate formal consultation for all pending and future requests for water diversions in the Columbia Basin affecting mainstem flows and tributaries inside critical habitats. Two exceptions may be recognized on a case-by-case basis: 1) Uses authorized with permit conditions that ensure no additional withdrawals will occur during the target period, or 2) uses authorized with permit conditions requiring replacement flows to offset depletion when flow targets are not met.

The NMFS will consider an offer of replacement flow to offset depletion in arriving at the "zero net impact" goal only when the permit application can produce evidence that they are ready and able to provide water that was put to beneficial use for transfer to instream use. To accept an offer, the NMFS must determine that it meets all RPA criteria for replacement flows including location, timing, quantity, and enforceability during times of shortage. The NMFS will not consider offers of incomplete water rights as replacement flow to offset depletions. An incomplete water right is speculative and the NMFS cannot analyze the likelihood of the applicant's ability to complete the right and transfer the use to instream flow.

We appreciate the cooperation of your staff in completing this consultation and look forward to working with them further to analyze existing Corps permits.

Sincerely,

A handwritten signature in dark ink, appearing to read "William Stelle, Jr.", with a stylized flourish at the end.

William W. Stelle, Jr.  
Regional Administrator

Enclosure

cc: Colonel Robert T. Slusar - Portland, Corps  
Colonel Donald T. Wynne - Seattle, Corps  
Lt. Colonel Donald R. Curtis, Jr. - Walla Walla, Corps  
John Keys - Boise, BOR

Endangered Species Act - Section 7  
Consultation

BIOLOGICAL OPINION

Inland Land, Inc.  
Columbia River

Agency: Department of Army, Corps of Engineers, Portland District

Consultation Conducted By: National Marine Fisheries Service,  
Northwest Region

Date Issued: May 16, 1997

Refer to: OSB1997-0634

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## EXECUTIVE SUMMARY

This biological opinion concludes that issuance by the U.S. Army Corps of Engineers (Corps) of a permit to construct a pumping facility in the Columbia River would jeopardize the continued existence of listed Snake River Salmon. The Opinion was prepared by the National Marine Fisheries Service (NMFS) in response to an October 31, 1996, request from the Corps for consultation regarding the potential effects on Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon from issuance of permit application number 96-697 for construction of a pumping facility on the Columbia River (River Mile 261) near Boardman, Oregon. The maximum water withdrawal capability of the proposed facility would be 303 cubic feet per second (cfs). The typical irrigation season runs from early April through late October. On average, the maximum withdrawal would occur roughly two weeks out of each irrigation season and would likely occur in early July.

In 1995 NMFS issued a Biological Opinion on operation of the Federal Columbia River Power System (FCRPS) that considered the role of altered streamflows in the decline of the listed salmon. The reasonable and prudent alternative (RPA) in the FCRPS Opinion identifies flow objectives for the Snake and Columbia Rivers intended to improve survival of migrating juvenile salmon. To increase the likelihood of meeting flow objectives, the RPA specifies management of Snake and Columbia River water, including significant demands on upstream storage reservoirs.

Concerned as well about the impacts of water withdrawals in the Basin on streamflows, NMFS contracted with the Bureau of Reclamation (BOR) to assess the cumulative effects of water withdrawals on Columbia Basin flows. The main objectives of this study were to identify the relative impacts of power and flood control operations and irrigation withdrawals on the system's ability to meet flow objectives.

The BOR used standard flow models to compare streamflows with and without irrigation diversions. The study without irrigation diversions assumed the same reservoir operations used in the study with irrigation diversions. BOR reservoir drafts in the upper Snake and Yakima Basins that supported irrigation diversions now supported flow augmentation. The report (still in draft) estimates that water withdrawals are nearly 40 percent of the average natural river flow in low flow years at McNary Dam during the irrigation season, which coincides with the salmon migration season.

This study further reveals that for the Columbia River at McNary Dam:

- C the FCRPS Opinion spring flow objective would be satisfied 92 percent of the time without irrigation withdrawals and is satisfied 72 percent of the time with irrigation withdrawals, and;
- C the FCRPS Opinion summer flow objective is satisfied 74 percent of the time without irrigation withdrawals and just 26 percent of the time with irrigation withdrawals.

For the Snake River at Lower Granite Dam:

- C the FCRPS Opinion spring flow objective would be satisfied 94 percent of the time without irrigation withdrawals and 64 percent with irrigation withdrawals, and;
- C the FCRPS Opinion summer flow objective would be satisfied 100 percent of the time without irrigation withdrawals and less than 15 percent with irrigation withdrawals.

In the FCRPS Opinion, the NMFS concluded that the existing environmental baseline was inadequate to meet the biological requirements of the listed species in part because of low streamflows in many years. The FCRPS Opinion required significant measures to improve streamflow conditions. The NMFS concludes in this Opinion that the continued increase in water depletions, when added to the existing environmental baseline (which includes significant impacts to flows from water withdrawals), and taken together with likely future water depletions, would degrade the environmental baseline and jeopardize the continued existence of listed Snake River salmon, as well as alter critical habitat. The Opinion proposes as a reasonable and prudent alternative that any permit issued be conditioned so that water withdrawals under the permit do not result in a net reduction in streamflow, or occur only during those times when salmon are not migrating or when flow objectives are being met.

## I. Introduction

### **A. Background**

In March, 1995, the National Marine Fisheries Service (NMFS) issued a biological opinion for operation of the Federal Columbia River Power System (FCRPS)<sup>2</sup>. The FCRPS Opinion concluded that the proposed operation of the FCRPS was likely to jeopardize the continued existence of the listed Snake River salmon. NMFS identified a number of immediate, intermediate, and long-term actions to implement its Reasonable and Prudent Alternative (RPA) to meet the no-jeopardy standard of the Endangered Species Act (ESA). One of the most important provisions of the RPA included a series of measures designed to increase flows in the Snake and Columbia Rivers to improve survival of migrating juveniles.

Concurrent to this process the U.S. Army Corps of Engineers (Corps) initiated two ESA consultations with the National Marine Fisheries Service (NMFS) in 1993 for issuance of permits, in accordance with section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act, to construct water withdrawal facilities in the Snake (Flat Top Ranch)<sup>3</sup> and Columbia Rivers (Port of Umatilla)<sup>4</sup>. These two consultations initiated discussions between NMFS and the Corps regarding the indirect effect of Corps section 10/404 permits resulting in the cumulative loss of streamflow throughout the Columbia Basin and the potential effect on salmon migration. The Corps<sup>5</sup> concurred that there was a need to study cumulative effects resulting from water withdrawals.

In September, 1994, NMFS signed an interagency agreement with the Bureau of Reclamation (BOR) to assess the cumulative effects of water withdrawals on streamflows. For the interim period until completion of this study, the Seattle District Corps requested that NMFS provide guidance on the question of when formal consultation should be conducted for Corps permits that are likely to result in water withdrawals. In a letter dated September 26, 1994, NMFS provided the following criteria:

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<sup>2</sup>Reinitiation of Consultation on 1994-1998 Operation of the Federal Columbia River Power System and Juvenile Transportation Program in 1995 and future Years (hereinafter referred to as the "FCRPS Opinion"). National Oceanic and Atmospheric Administration, National Marine Fisheries Service, 7600 Sand Point Way NE, Bin C15700, Bldg 1, Seattle, WA, 98115.

<sup>3</sup>Corps, Seattle District, Permit Application No. 93-2-00100.

<sup>4</sup>Corps, Portland District, Permit Application No. 93-00941.

<sup>5</sup>A March 2, 1994, letter from Mr. Burt Paynter, Portland District Corps, to Mr. Merritt Tuttle, NMFS; and a September 1, 1994, letter from Mr. Thomas Mueller, Seattle District Corps, to Mr. Merritt Tuttle, NMFS.

For the Snake River anywhere above Ice Harbor Dam, formal consultation should be conducted on any permit that is likely to result in a water withdrawal greater than 5 cfs. In the mainstem Columbia River anywhere above Bonneville Dam and on the mainstem Snake River up to Ice Harbor Dam, formal consultation should be conducted on any permit that is likely to result in a water withdrawal greater than 25 cfs.

## **B. Initiation of Consultation**

In a letter dated July 19, 1996, the Corps requested formal consultation for issuance of permit application number 96-697 for construction of a pumping facility on the Columbia River near Boardman, Oregon. A biological assessment (BA) for the proposed action was provided. In a letter to the Corps, dated August 8, 1996, NMFS stated that information regarding cumulative effects from the proposed action was deficient and requested that more information be provided. The Corps provided a revised BA (cover letter dated October 31, 1996) which this consultation is based on. The revised BA concluded that the proposed action would have no adverse effect on the listed Snake River salmon. In keeping with the established consultation guidance, the Corps has initiated formal consultation with NMFS.

The objective of this biological opinion is to determine whether issuance of the proposed permit is likely to jeopardize the continued existence of the Snake River sockeye salmon (*Oncorhynchus nerka*), Snake River spring/summer chinook salmon (*O. tshawytscha*), and Snake River fall chinook salmon (*O. tshawytscha*), or result in the destruction or adverse modification of their critical habitat.

## **II. Proposed Action**

The proposed action is the issuance of permit application number 96-697 to Inland Land, Inc. (applicant), for the construction of an irrigation water withdrawal facility in the John Day pool of the Columbia River (River Mile 261) in Morrow County near Boardman, Oregon. The pumping facility would have a maximum withdrawal capacity of 303 cubic feet per second (cfs). Construction activities would include excavation of a trench in the river bottom for the intake pipes and placement of a pump station platform adjacent to the river. All in-water construction is proposed to take place from December 1 through March 31 of any calendar year.

This consultation would be in place until 1999 or future years, depending on information gained from ongoing research under the FCRPS Opinion and FCRPS reconfiguration.

### **Intake Pipe**

Two 66-inch diameter pipes would be placed parallel in the river extending roughly 261 feet from the shoreline. A 66-inch diameter, 108-foot long intake screen manifold would be connected to the end of the two 261-foot intake pipes. The intake screen manifold would sit perpendicular to the intake pipes and parallel to the river channel. Approximately 220 feet of trench would be required for the intake pipes. The bottom width of the trench would be 21 feet and depth would range from 0 feet at the intake to 15.5 feet at the shoreline. Some drilling and blasting may be required for trench excavation. Excavated materials would consist mostly of rock and sediment and would be removed with a barge-mounted crane and clamshell or backhoe. This material would be placed on the barge and hauled to shore where it would be transported roughly 1 mile upland.

The 66 inch diameter intake pipes would be welded on shore and pulled into position using a barge mounted winch. The ends of the pipes would be capped and floated into position and slowly sunk into place. The 108-foot long intake screen manifold would be barged to its location and placed on steel H-pile. Piling would be driven to practical refusal with a barge mounted pile driver. Fish screens would be barged to the intake manifold and placed with use of a crane and underwater construction workers. A back flush air purge system would be placed by installing five PVC air lines on the intake pipes.

#### Pumping Platform

A pit roughly 20 feet wide by 100 feet long would be excavated to receive intake and discharge pipe and pump caissons. Roughly 2,000 cubic yards of material would be placed to raise the platform to 270 feet mean sea level or about 2.5 feet above the maximum pool elevation. As much material as practical would be taken from the trench excavation stockpile. The pump station platform would consist of a concrete pump deck with nine pumps, a 20-foot by 30-foot pump panel house, and an electric substation. Access roads would be constructed with water bars to contain storm runoff.

#### Pumping Operation

The BA provides a table and graph describing the applicants expected water withdrawal volumes through an average irrigation season. While the maximum pumping capacity is 303 cfs, the applicant expects on average to draw this much volume two weeks out of the irrigation season (April-October). Maximum withdrawal would likely occur in early July.

### **III. Biological Information and Critical Habitat**

The proposed action is likely to affect the listed Snake River salmon. Based on migratory timing, it is not likely that adult and juvenile Snake River sockeye salmon, and adult and juvenile Snake River fall chinook salmon would be present during the proposed in-water work period. The Corps' Annual Fish Passage Reports (1992-

1995) indicate that some adult Snake River spring/summer chinook salmon could be present in the proposed action area in the later half of March. It is expected that few, if any, juvenile Snake River spring/summer chinook salmon would be present during in-water construction activities. Both adult and juvenile life stages of the listed Snake River salmon species would be present in the proposed action area at various periods during the irrigation season.

The proposed action would occur within designated critical habitat for the listed salmon species. An action area is defined by NMFS regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The area within designated critical habitat affected by the proposed action is the Columbia River at RM 261 downstream to the Pacific Ocean. This area serves as a migratory corridor for both adult and juvenile life stages of Snake River sockeye salmon, Snake River spring/summer chinook salmon and Snake River fall chinook salmon. Essential features of the adult and juvenile migratory corridor for the listed species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. The essential features this proposed project may affect are substrate, water quality, and safe passage resulting from in-water construction activities and water quantity, water velocity, and safe passage conditions as a result of water withdrawal operations.

Additional background on listing status, biological information, and critical habitat elements for Snake River salmon are described in Attachment 1.

#### **IV. Evaluating Proposed Actions**

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). NMFS discusses the analysis necessary for application of these standards in the particular context of the listed species of Pacific salmon in Attachment 2. NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of (1) defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any

cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat it must identify any reasonable and prudent measures available.

For the proposed action, NMFS's jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS's critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for adult and juvenile migration of the listed Snake River salmon under the existing environmental baseline.

#### **A. Biological Requirements**

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stocks, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

When considering the status of the listed species in all its life stages, biological requirements are expressed in terms of cohort replacement ratios and numerical escapement goals. Refer to Attachment 2 of this Opinion and Chapter IV of the Proposed Recovery Plan for a discussion of these requirements. As discussed in greater detail in the Proposed Recovery Plan, it is not possible, based upon currently available scientific data and analysis, to prescribe life-stage specific numerical survival rates that are necessary to achieve the combined life-stage requirements described above. However, survival must improve in all life stages, given current critically low population levels.

For actions that affect juvenile and adult migration, biological requirements include increased migration survival and improved habitat characteristics that function to support successful migration.

## 1. Flow and Migration Survival

Studies conducted within and outside the Columbia Basin have established that a general relationship exists between increasing fish survival and increasing river flows (Cada et al. 1994). Causal factors, which may explain this relationship, are poorly understood and alternative factors are likely to dominate in different flow ranges and in different years (ISG 1996). Some of these potential causal factors include water velocity, spill, gas saturation, flooding, and temperature. These factors mediate survival through fish migration speed, predation, route of passage at a dam, feeding, growth, and gas bubble trauma (ISG 1996). Additional research is needed to more clearly elucidate the causal factors and to determine those flows (or associated causal factors) that are necessary for survival and recovery of listed Snake River salmon. Such research is required through the RPA of the FCRPS Opinion and the NMFS Proposed Recovery Plan.

Until additional research results are available, NMFS has developed interim flow objectives to aid in improving survival of listed Snake River salmon smolts (NMFS 1995). These flow targets are as follows:

	<u>S Snake River at Lower Granite Dam</u>	<u>Columbia River at McNary Dam</u>
Spring	April 10 to June 20 85-100 kcfs	April 20 to June 30 220-260 kcfs
Summer	June 21 to August 31 50-55 kcfs	July 1 to August 31 200 kcfs

The Reasonable and Prudent Alternative specifies management of Snake and Columbia River water to improve the ability of the FCRPS to achieve these target flows. NMFS (1995) reviewed available information through early 1995 and proposed the interim flow objectives based upon the best available information at the time. Factors considered in developing the flow objectives included: historical river flows and velocities, which were much higher than at present; an analysis of the increase in juvenile travel times associated with lower river flows, which increases exposure to predation and may disrupt optimum timing of ocean entry; and the observation that years with low river flows do not correspond with years of good adult returns.

Since development of NMFS's interim flow objectives, some additional information has become available. Taken together, this information tends to support the conclusion that increased flow is associated with increased juvenile survival, particularly for fall chinook, which migrate during the summer months.

One fall chinook study cited in NMFS (1995), Hilborn et al. (1993), has been called into question, but newer data support the flow-survival relationship. The Hilborn study indicated a significant relationship between flow and adult returns of Priest Rapids fall chinook. A reanalysis of the data in Skalski et al. (1996) suggests that it is not possible to determine the key factors that influence these hatchery return rates with the available data and statistical techniques. Other recent studies, however, reaffirm the conclusion of the FCRPS Opinion that for fall chinook higher flows result in improved survival. Zabel (1994) relies on recent PIT-tag releases to conclude that a significant correlation between flow and juvenile Snake River fall chinook travel time exists. This study also found that migration date and fish length (each of which may indicate degree of smoltification) significantly correlated with fall chinook travel time. One study based on PIT-tag observations in the Snake River found a significant relation between within-season reach survival of juvenile fall chinook salmon and flow (Smith et al. 1996). This study found no relationship between survival and water temperature. A recent analysis of seasonal juvenile fall chinook detection rates at Lower Granite Dam (roughly equivalent to minimum survival estimates) indicates a significant correlation with both average seasonal flow and average seasonal temperature (Berggren 1996).

Some new information is also available for spring/summer chinook salmon. Reach travel time and survival estimates have been determined from PIT-tagging experiments (Iwamoto et al. 1994; Muir et al. 1995,1996; Schiewe 1996). Analysis of these results relative to flow indicates a correlation with travel time both within and among seasons and a correlation with survival when data from all years are combined (S. Smith, NMFS, pers. comm., March 1997). Correlations between flow and survival within seasons were not significant.

## **B. Environmental Baseline**

The current rangewide status of the listed species under the environmental baseline is described in Attachment 1. The environmental baseline, to which the effects of the proposed action would be added, "include the past and present impacts of all Federal, State, or private activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process" 50 C.F.R. § 402.02. The biological requirements of the listed Snake River salmon are currently not being met under the environmental baseline. Their status is such that there must be a significant improvement in the environmental conditions of the critical habitat over those currently available under the environmental baseline. Any further degradation of these conditions would have a significant impact due to the amount of risk the listed Snake River salmon presently face under the environmental baseline (see Attachment 1).

To evaluate the environmental baseline in the action area it is necessary to assess the aggregate quantity and significance of water withdrawals upstream of the proposed action as well as those within the action area. Although the effect of this proposed withdrawal would affect the listed salmon below its point of diversion, it would be added to the aggregate of all upstream withdrawals.

The purpose of the BOR (1997) study was to establish the environmental baseline streamflow conditions in the Columbia River Basin prior to the major human activities that have altered streamflows, to compare these natural conditions to present conditions, and to identify the relative contribution that power and flood control reservoir operations and irrigation withdrawals have made to affect the change from natural to current streamflow conditions.

The number of irrigated acres and the estimated irrigation withdrawals in the western United States is well documented. In the Columbia River Basin above McNary Dam, some thirty million acre-feet of water is withdrawn for irrigation annually (BPA 1993). The BOR study (1997) estimates that these withdrawals are nearly forty percent of the average natural river flow in low flow years at McNary Dam during the irrigation season, which coincides with the salmon migration season.

The BOR study tasks included an estimate of the natural streamflows, the streamflows with current irrigation withdrawals and reservoir operations (Task 1), the streamflows with no irrigation withdrawals (Task 4a), and the streamflows with no reservoir operations, at approximately sixty sites in the Columbia River Basin. The NMFS used the results of Tasks 1 and 4a, and an earlier study (BPA 1993), to determine the relative contribution of reservoir operations and water withdrawals to the reduction of spring and summer salmon migration flows in the Columbia and Snake Rivers.

In the cumulative effects study the BOR used a standard monthly reservoir regulation model to estimate streamflows with and without irrigation for the historical period 1929-1978. Task 1 modeled the expected reservoir operation to meet the requirements of the Biological Opinion, with current reservoir operations for power and flood control, and with the current level of irrigation withdrawals. Task 4a modeled the reservoirs to the same monthly ending elevations as Task 1, but the streamflows did not include irrigation withdrawals. BOR reservoir drafts in the upper Snake and Yakima Basins that supported irrigation diversions in Task 1 now supported flow augmentation in Task 4a. The difference between the spring and summer streamflows in Task 1 and Task 4a is the effect of irrigation withdrawals.

The BPA (1993) estimated the streamflows with the effect of irrigation withdrawals but unaffected by reservoir operations. The

difference between the BPA streamflows and the Task 1 streamflows is the effect of current flood control and power operations.

The following are the principal conclusions of this study.

#### Snake River at Lower Granite

Irrigation withdrawal is the principal reason for missing flow objectives in the Snake River.

a. But for irrigation withdrawals, summer flow objectives would be met every year (100%)(with reservoirs operated for flow aug.), whereas with withdrawals, summer flow objectives are met less than fifteen percent of the time. For the lowest eight streamflow years, the average summer flow at Lower Granite reservoir with no irrigation is nearly two hundred and fifty percent (250%) of the average flow under current conditions: 60,500 cfs compared to 24,500 cfs.

b. But for irrigation withdrawals, spring flow objectives would be met ninety-four percent (94%)(with reservoirs operated for flow aug.) of the time, compared to sixty-four percent (64%) with withdrawals. The fifty year average spring flows at Lower Granite without irrigation are one hundred and twenty percent (120%) of the flows in the Opinion.

#### Columbia River at McNary

Power and flood control cause the largest reductions to McNary spring streamflows. Nonetheless, but for irrigation withdrawals, our ability to meet spring and summer streamflow objectives would significantly improve.

a. But for irrigation withdrawals, summer streamflow objectives would be met seventy-four percent (74%) of the time, compared to twenty-six percent (26%) under the FCRPS Opinion. For the lowest eight streamflow years, summer streamflow objectives are missed by an average 90 kcfs; irrigation withdrawals account for two-thirds of the total shortfall.

b. But for irrigation withdrawals, spring streamflow objectives would be met ninety-two percent (92%) of the time, compared to seventy-two percent (72%) under the FCRPS Opinion. For the lowest eight streamflow years, spring streamflow objectives are missed by an average 25 kcfs; on average, irrigation withdrawals account for all of the total shortfall.

### V. Analysis of Effects

#### **A. Effects of Proposed Action**

The Corps determined that the proposed action would have no effect on listed salmon. This determination is based on (1) all in-water construction activities would occur between December 1 and March 31 of any calendar year, and (2) any effects from water withdrawal operations would be nearly immeasurable. In reviewing this action, the NMFS reviewed the impacts of both the in-water construction activities and the pumping operations to determine effects on water quantity, water velocity, and safe passage (without impediment or delay).

### **1. In-Water Construction Activities**

As stated in section III of this opinion, NMFS does not expect that adult or juvenile life stages of Snake River sockeye salmon, Snake River fall chinook salmon, or juvenile Snake River spring/summer chinook salmon would be present in the proposed action area during in-water construction. Adult Snake River spring/summer chinook salmon could be present in the immediate action area during the later half of March.

Adult Snake River spring/summer chinook salmon enter the Columbia River February through May. Data from the Corps' Annual Fish Passage Reports show that the 10-year average (1986-1995) passage of adult spring chinook at in March at Bonneville Dam is 1,212 fish. Adult fish counting at John Day and McNary Dam typically begins in April 1 and is conducted in two eight-hour shifts from 4:00am to 8:00pm. On April 1, five, seven, and zero fish were counted at John Day Dam in 1995, 1994, and 1993, respectively. At McNary Dam, just one fish was counted on April 1 in 1995 with no fish counted on this date in 1994 and 1993. However, 13, 31, and 1 fish were counted at McNary Dam by April 5 in 1995, 1994, and 1993, respectively. In addition, 96 fish were counted at McNary Dam on April 1 in 1992. Therefore, it is reasonable to assume that some adult Snake River spring/summer chinook salmon could be present in the John Day Pool in the later half of March.

Water quality could be severely impacted by accidental spills of hazardous materials such as petroleum products. Construction staging would occur in a confined area away from the river as required by the state of Oregon. In addition, a Spill Prevention Plan is required by the state. Turbidity created from construction activities would be temporary and localized. The state of Oregon requires that turbidity not exceed 10 percent above background for more than two hours and would require that monitoring be conducted 100 feet upstream and 100 feet downstream of the construction site during construction activities.

Pile driving activities have the potential to delay adult migration. Salmonids can detect sound frequencies generated by pile driving within a radius of 300 meters (Feist 1992). Other noises associated with construction could have the same effect. Blasting has the

potential to delay, injure or kill migrating adults if present in the immediate action area.

Few, if any, listed salmon species would likely be present during the in-water work period. The exception to this is adult Snake River spring/summer chinook salmon which could be present in the immediate action area in the later half of March. To mitigate for this potential, in-water work should be completed by March 15.

## **2. Pumping Operations**

### **a. Safe Passage (fish screens)**

The intake structure would be fitted with wedge-wire fish screens. The maximum screen opening would be 0.0689 inches (1.75mm) with a design approach velocity of 4.0 feet per second. An automatic air burst system would be used for screen cleaning. These criteria satisfy NMFS fish screen requirements.<sup>6</sup>

### **b. Safe Passage, Water Velocity, Water Volume**

The BA provides a table that describes the applicants expected average pumping needs through the course of the irrigation season. On average, pumping would occur every year from April through mid-October. The maximum withdrawal of 303 cfs would occur approximately two weeks out of each irrigation season. It is estimated that the average withdrawal would be 49,223 acre feet per year. The BA does not describe how this calculation was accomplished. To estimate potential impacts resulting from water withdrawal on migrating juvenile salmon, the Corps used the Columbia River Salmon Passage Model CRiSP 1.5.3. This model predicted that with a withdrawal of 303 cfs at a Columbia River flow between 150,000 and 250,000 cfs, 14.4 minutes would be added to yearling chinook migration time through the John Day Pool. This is the largest increment in travel time predicted by the model for yearling chinook salmon resulting from pumping operations. The BA did not provide information regarding incremental increase in travel time for subyearling chinook or sockeye salmon.

The CRiSP model was also used to predict change in survival under irrigation operations for both a high flow (1996 flows) and low flow (1992 flows) scenario for two reaches--McNary Dam to John Day Dam (John Day Pool) and from the Lower Granite Pool to Bonneville Dam. The model predicted no change in survival except for yearling and early subyearling chinook salmon under high flow in the John Day Pool (-0.023 percent change in survival).

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<sup>6</sup>NMFS Revised Juvenile Fish Screen Criteria, March 23, 1995, and a May 9, 1996, Addendum, Juvenile Fish Screen Criteria for Pump Intakes.

The NMFS disagrees with the analysis presented by the Corps primarily because it does not take into account the inadequacy of the environmental baseline in meeting the species' biological requirements, does not consider the contribution of existing water withdrawals to this inadequate environmental baseline condition, and does not consider the potential effects of this action in combination with future potential water withdrawals in the Columbia River Basin. The NMFS cannot accept the BA's conclusion that the proposed action does not affect the listed species when it would undermine significant measures to improve the environmental baseline called for in the RPA of another major biological opinion, and when the action, if allowed to go forward, would likely then combine with similar future actions to further degrade the environmental baseline.

As described in section IV, the NMFS has concluded that flow reductions in the Snake and Columbia Rivers are a cause of decline of listed Snake River salmon and that flow augmentation is an important tool for salmon restoration, especially in low flow years. In other words, the environmental baseline is inadequate with respect to flows, especially in low flow years. To increase the probability of meeting the interim flow objectives, the FCRPS Opinion calls for several actions that augment flows by placing heavy burdens on upstream storage and irrigation. For example, the BOR is providing, through current Federal storage and water acquisition purchased at market rates, 427,000 acre feet of water for flow augmentation in the Snake River. This water also contributes to flows in the Columbia below McNary Dam. In the Columbia, water is provided from storage projects in the upper Columbia Basin (Canada and Montana) and the mid-Columbia (Grand Coulee in Washington).

As noted in Section IV above, water withdrawals in the Columbia Basin contribute significantly to the inability of the system to meet flow objectives, especially in low flow years. As in the case of the FCRPS Opinion, the NMFS cannot pass lightly on actions that historically have contributed so significantly to degrading environmental baseline conditions, but must give them a hard look.

The BA also ignores the problems associated with trying to measure the incremental impact of a single action that, taken together with other actions, has a significant impact. The cumulative impact of *existing* withdrawals has already been discussed. If this action were allowed to go forward as proposed, then presumably additional withdrawals could also proceed in the future, on the same logic. Each subsequent withdrawal by itself may have only a small incremental impact, but taken together they may be expected to have a significant impact that would degrade flows even further. The states of Oregon, Washington and Idaho all have in place moratoria on further withdrawals in the Basin. In some cases, however, these moratoria have significant exceptions. For example, the action considered under this Opinion involves a pending right that has been repeatedly extended. These moratoria are also subject to legislative modification. The Governor of Washington is currently considering

whether to sign a bill passed by the Washington legislature to repeal that state's moratorium. As the interior Columbia Basin grows and develops it is foreseeable that demand for water will continue to grow as well. For the Federal agencies to allow additional future withdrawals to proceed, on the logic that each one by itself has a small impact, would undermine one of the major improvements in habitat conditions and further degrade the environmental baseline.

The BA's reliance on a mathematical model to conclude that the proposed action has no effect misses the mark. The model is used to predict an incremental change in survival for one action (i.e., pumping operations through the irrigation season) at one point in space. Under such an approach, one could take this model for each individual water depletion that occurs or may occur in the future in the Columbia Basin and reach the same conclusion, even to the point where there was no flow at the mouth of the Columbia River. Yet the data used for comparison (BA, Table 2) shows poor survivals, especially in low flow years which is what one would expect based on current research.

## **B. Cumulative Effects**

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Not all water withdrawals in the Columbia River Basin require a section 404/10 permit from the Corps. Ground water withdrawals and intake structures in non-navigable waterways do not require the permits. It is likely that there will be future withdrawals not covered by Corps action and section 7 consultations that will further degrade flows in the Snake and Columbia Rivers.

## **C. Consistency of Proposed Action with Proposed Recovery Plan**

The NMFS's Proposed Recovery Plan for the listed Snake River salmon places the highest priority on actions that will reverse the primary factors for the species' decline and eliminate impediments to recovery. For mainstem and estuarine ecosystems, one of the primary biological objectives of the Proposed Recovery Plan is to reduce loss of juvenile fish through flow augmentation and improved water management (Recovery Plan at V-2-17). Recovery actions to address this objective are identified as priority one under "Tasks to Avoid Extinction" and include steps to increase the probability that water and flows will be available for migrating salmon when they need it, and to manage water during the migration season in a manner that ensures maximum benefits for anadromous fish (Recovery Plan at V-2-17 through 29). Furthermore, tasks associated with the biological objective of providing adequate instream flows are identified as necessary to begin recovery of tributary ecosystems (Recovery Plan at V-1-53 through 56); one of these tasks calls for continuation of the existing moratoria on issuance of water rights in the Snake/Columbia River mainstems and extension of those moratoria to include tributaries and ground water in continuity with surface flows (Recovery Plan at V-1-56).

The proposed action is not consistent with primary objectives of the Proposed Recovery Plan. Issuance of the proposed permit would allow for continued decline of the existing deficient environmental baseline, impeding region-wide efforts to recover salmon.

## **VI. Conclusion**

NMFS has determined that, based on the available information, the issuance of permit number 96-697 to Inland Land, Inc. is likely to jeopardize the continued existence of listed Snake River sockeye salmon, Snake River spring/summer chinook salmon, and Snake River fall chinook salmon and result in destruction or adverse modification of their critical habitat. Under the RPA in the FCRPS Opinion, considerable effort is being expended by Federal, state, and private entities to provide flow augmentation as well as other actions

required in the RPA. The benefits of flow augmentation do not stop at McNary Dam and are intended to carry to the estuary. It is not consistent for NMFS to request that such an effort be expended by upstream water users and not ensure that their efforts provide benefits for listed salmon to the estuary.

These actions, along with other actions under the RPA in the FCRPS Opinion, will be reevaluated in 1999. NMFS will then consider and make recommendations for implementation of long-term changes to the FCRPS to permit recovery of the listed Snake River salmon. According to the FCRPS Opinion:

The reasonable and prudent alternative establishes an interim operation during which conditions are improved immediately for fish, alternative long term paths are established for major reconfigurations of the hydropower dams, and intensive experimentation, monitoring and evaluation are to occur. The long term alternatives include: Option 1 - implementation of passage improvements at dams, such as surface collectors, that significantly improve bypass and/or collection efficiency; Option 2 - implementation of a spillway crest drawdown at the Snake River projects; Option 3 - implementation of a natural river drawdown at the Snake River projects.

The interim flow objectives are an integral part of the RPA in the FCRPS Opinion. The conclusion that the implementation of the RPA avoids jeopardy is premised in part on the system's ability to provide flow. Continued increase in water depletions undermine the no jeopardy conclusion as well as efforts by upstream water users to contribute to recovery. Therefore, the effects of the water withdrawal enabled by the proposed action, when added to the effects of the current water withdrawals under the environmental baseline and the effects of future non-federal water withdrawals discussed in the Cumulative Effects section, above, are likely to jeopardize the listed salmon and adversely modify their critical habitat.

## **VII. Reasonable and Prudent Alternative(s)**

The regulations implementing section 7 of the ESA (50 CFR 402.2) define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that (1) can be implemented in a manner consistent with the intended purpose of the action, (2) can be implemented consistent with the scope of the action agency's legal authority, (3) are economically and technologically feasible, and (4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species and avert the destruction or adverse modification of critical habitat.

This RPA recommends that the subject permit, if issued, be conditioned to ensure that there is no net loss of streamflow during the juvenile migration period so long as flows are lower than the

flow objectives set forth in the FCRPS Opinion. The goal of the RPA is to allow the action to forward with conditions that interfere with the applicants proposed activity only to the extent necessary to avoid jeopardizing the continued existence of listed Snake River salmon and avoid modification of critical habitat. The Reasonable and Prudent Alternative is that the Corps conditions the permit as follows:

1. Before water use may begin under this permit, the permittee must install a suitable measuring device as approved by NMFS. The permittee will maintain the measuring device in good working order, will keep a complete record of the amount of water used each week, and will submit a report that includes the recorded water use measurements to NMFS at the conclusion of each irrigation season or more frequently as required by NMFS.

2. Pumping will be restricted so that no water withdrawal occurs during times designated as flow objective periods in the FCRPS Opinion unless: (A) the permittee has been notified by NMFS that the flow objectives for spring, summer or both are likely to be met on a weekly basis, or (B) the permittee proves to NMFS' satisfaction that he will provide for instream use, at the point of the diversion or upstream of this point during periods when flow objectives are not likely to be met, an amount of water from completed water rights that is equivalent to the flow depletion caused by the new use. This replacement flow is intended to result in a zero net impact of the new diversion on flow targets.

The NMFS will treat the spring and summer periods independently. For example, if spring flow objectives are projected to be met on a weekly basis, but summer objectives are not, then NMFS will agree to pumping in the spring, but not the summer. The spring and summer periods are:

	<u>SNAKE RIVER AT LOWER GRANITE DAM</u>	<u>COLUMBIA RIVER AT MCNARY DAM</u>
Spring	April 10 to June 20 85-100 kcfs	April 20 to June 30 220-260 kcfs
Summer	June 21 to August 31 50-55 kcfs	July 1 to August 31 200 kcfs

NMFS will determine when these targets are likely to be met based on volume runoff forecasts and, if requested, will notify the applicant by April 16 of each year of forecast results.

#### **VIII. Conservation Recommendations**

Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be implemented by the Corps:

1. To the greatest extent possible, the Corps, should develop a database of all existing permits that have resulted in a water withdrawal. For consistency, this database should be applied for each district and contain, where possible, the following information: (1) location by state, county, nearest town or city, waterway, and stream mile; (2) the type of facility constructed (e.g. land based pumping platform with pipes extended in water or elevated platform over water); (3) indicate whether fish screens are present; and (4) pumping capacity of the facility.

2. The Corps should complete all necessary work to decide whether existing permits in the Columbia and Snake River Basins are candidates for consultation as ongoing actions before spring 1999. To speed up consultation and improve salmon survival, the Corps should accelerate a feasibility study of alternatives to rank permits for reevaluation based on relative effects on salmon. Using this information, NMFS will decide in coordination with the Corps which existing permits warrant consultation. This measure is not intended to be included in the permit conditions for the proposed action. It is an evaluation NMFS believes is necessary to make progress toward salmon recovery.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat, NMFS requests notification of the implementation of any conservation recommendations.

#### **IX. Reinitiation of Consultation**

Consultation must be reinitiated if: the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

Significant changes in the operation and configuration of the hydropower system will be new information that warrants reexamination

of these permit conditions. Reconfiguration of the FCRPS would warrant reinitiation of the this consultation.

If the states of Oregon, Washington, and Idaho adopt comprehensive programs to address instream flow restrictions in the Columbia Basin, that may alleviate NMFS' concerns about the cumulative effects of withdrawals, NMFS will work with the states to develop such programs that could lead to reinitiation of consultation.

## X. References

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion (other than the BA and communications identified in the Background section of this Opinion).

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## **XI. Incidental Take Statement**

Sections 4 (d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; they must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered in this incidental take statement. If the Corps

- 1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or
- 2) fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

### **A. Amount or Extent of the Take**

The FCRPS Opinion prescribes measures that avoid jeopardy and reduce incidental take. NMFS expects that the proposed action would exacerbate the efforts now occurring in the Columbia Basin to recover the listed Snake River salmon. The proposed action, as modified by the reasonable and prudent alternative, is expected to result in minimal incidental take of listed Snake River salmon.

### **B. Reasonable and Prudent Measures**

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimizing take of Snake River sockeye salmon, Snake River spring/summer chinook salmon and Snake River fall chinook salmon:

1. The permit shall be conditioned to require measuring and reporting of water use by the permittee to NMFS.
2. Except for provisions listed under Terms and Conditions below, water withdrawals associated with the proposed permit shall not occur during flow objective periods designated by the FCRPS Opinion.
3. All in-water work shall occur between December 1 and March 15 of any calendar year.

### **C. Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The permit shall be conditioned to require measuring and reporting of water use by the permittee to NMFS.
  - a. The permittee will maintain a measuring device in good working order, will keep a complete record of the amount of water used each week, and will submit a report that includes the recorded water use measurements to NMFS at the conclusion of each irrigation season or more frequently as required by NMFS.
2. Except for the following provisions listed below, water withdrawals associated with the proposed permit shall not occur during flow objective periods designated by the FCRPS Opinion unless:
  - a. the permittee has been notified by NMFS that the flow objectives for spring, summer or both are likely to be met based on runoff forecasts; or
  - b. the permittee proves to NMFS' satisfaction that he will provide for instream use, at the point of diversion during periods when flow objectives are not expected to be met, an amount of water from completed water rights that is equivalent to the flow depletion caused by the new use. This flow is intended to result in zero net impact of the new diversion on flow targets.
3. All in-water work shall occur between December 1 and March 15 of any calendar year.

a. In-water work includes, but not limited to, blasting, excavating, pile driving, laying of pipe and fish screen manifold placement, and work by divers.